Montana Clinical Communication & Surveillance Report

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
Room C314, Cogswell Building
PO Box 202951
Helena, Montana 59620-2951

Issue January - March 2005

EXTENDING THE PUBLIC HEALTH IMPACT OF SCREENING FOR DIABETES IN HIGH RISK POPULATIONS: OPPORTUNITIES IN AMERICAN INDIAN COMMUNITIES

WHAT'S INSIDE

BACKGROUND

American Indians are experiencing an epidemic of type 2 diabetes and cardiovascular disease, particularly in the Northern Plains. Since 1998, many tribes have implemented diabetes screening programs as part of their public health efforts to control and prevent diabetes. When the Diabetes Prevention Program showed that type 2 diabetes could be prevented in those with abnormal glucose tolerance, blood glucose screening assumed a new importance in Indian communities[1]. Blood glucose screening can identify not only those with undiagnosed diabetes but also those at high risk to develop diabetes (pre-diabetes) for whom there are now proven interventions to prevent the onset of diabetes. And recent studies have shown that individuals with glucose values diagnostic of pre-diabetes are also at risk for cardiovascular disease[2,3]. Thus, the potential public health impact of blood glucose screening in American Indian communities now extends beyond the recognition of undiagnosed diabetes to include the identification and intervention in individuals at risk for both diabetes and cardiovascular disease. This report describes trends and the factors associated with blood glucose screening among American Indian adults over a five-year time period.

METHODS

In 1999, 2001, and 2003 approximately 1000 American Indian adults aged 18 years and older were interviewed each year in telephone surveys using an adapted Behavior Risk Factor Surveillance System (BRFSS) survey[4]. The Montana Department of Public Health and Human Services, in collaboration with the Billings Area Indian Health Service, adapted the questions and conducted the telephone survey. Of the 56,038 American Indians living in Montana identified in the 2000 census, the majority (59%) reported living on one of the seven reservations. Trained interviewers made telephone calls to a random sample of households with three-digit telephone prefixes indicating a location on or near the reservations. The number of completed telephone calls for each of the surveys was proportional to the number of Indian households on each reservation. Based on the total number of Indian adults aged 18 years or over living in the household, one adult from the household was randomly selected to participate.

Respondents were asked about their history of diabetes, high blood pressure, high cholesterol, and smoking. Female respondents who had been told they had gestational diabetes or high blood pressure during pregnancy were not categorized as persons with a current diagnosis of diabetes or hypertension. Respondents who reported that they smoked cigarettes everyday or some days were categorized as current smokers. Self-reported height and weight were used to calculate a body mass index (BMI, kg/m^2), and a value of $\geq 30.0\ kg/m^2$ was defined as obese. Respondents were also asked how many times in the past twelve months have they seen a doctor, nurse, or other health care professional and if any member of their immediate family, including parents, brothers or sisters, ever had diabetes. To assess screening for diabetes, respondents without a history of diagnosed diabetes were asked two questions: "Glucose or sugar is a substance found in your blood. Have you ever had your blood glucose or sugar checked to see if you have diabetes?" and "When was the last time your blood glucose or sugar level was measured by a health care professional?" The response categories for the latter question included within the past year (1 to 12 months ago), within the past three years (1 to 3 years ago), over three years ago, do not know/not sure, and refuse to answer.

Data analyses were completed using SPSS V12.0 software (SPSS Inc., Chicago, Il.) Chi-square tests for linear trend were used to compare differences in trends of screening for diabetes in the past three years overall, and by age and sex in 1999, 2001, and 2003. Chi-square tests were also used to test the association between screening for diabetes in the past three years by age, sex, and associated risk factors for diabetes in 2003. Multiple logistic regression analyses were used to identify factors independently associated with screening for diabetes in the past three years in 2003.

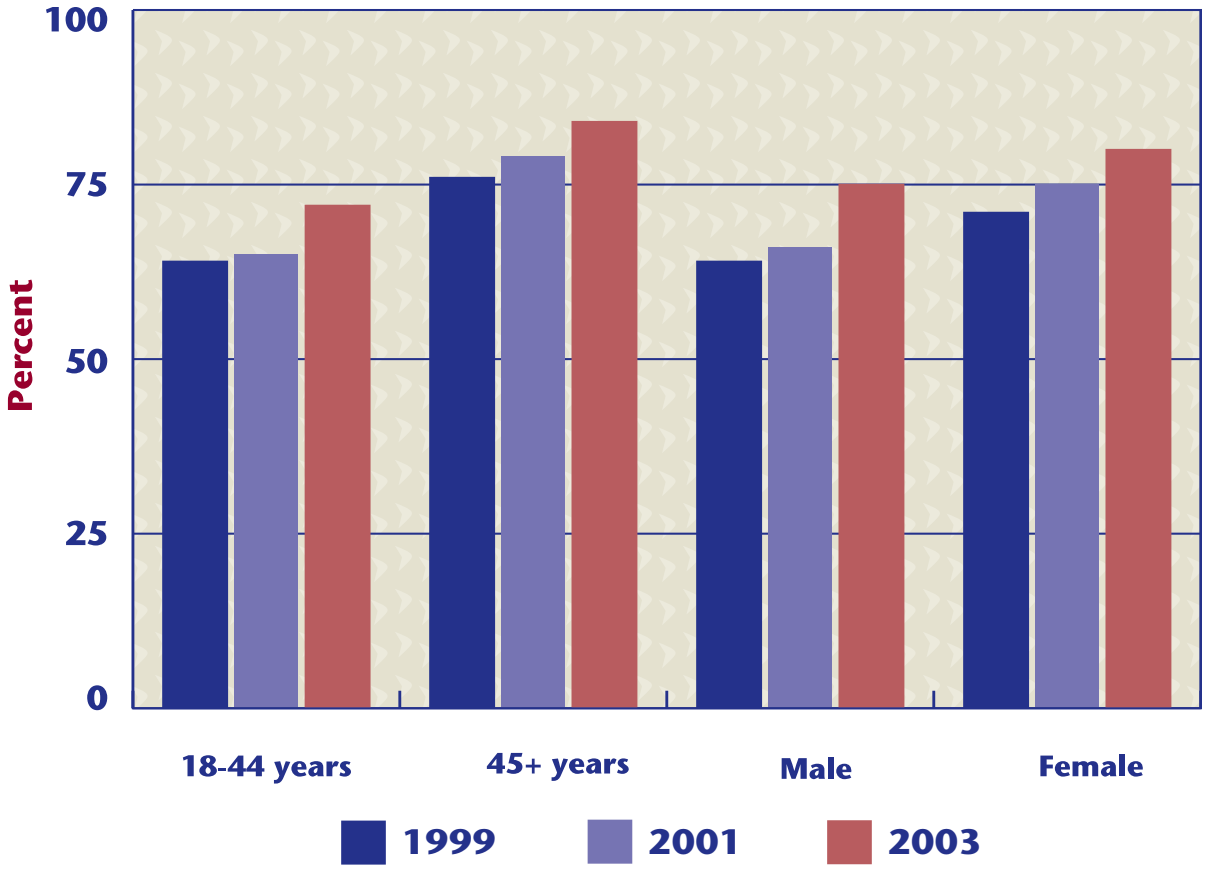
RESULTS

One thousand, 1,006, and 1,000 surveys were completed in 1999, 2001, and 2003, respectively. Among those responding to the surveys each year, the proportion of females ranged from 57% in 1999 to 59% in 2003, and the mean age of respondents increased significantly from 42 years in 1999 to 46 years in 2001 and 2003. During the 5-year period, the proportion of American Indian adults reporting a diagnosis of diabetes increased from 12% to 16% ($P < 0.05$). Each year over 800 individuals with no current history of diabetes

were available to respond to the questions about blood glucose screening (Figure 1). Of those, the proportion who recalled screening for diabetes within the past three years increased from 68% in 1999, 71% in 2001, to 78% in 2003 (P <0.001). Between 1999 and 2003, screening increased significantly among men, women, those 18 to 44 years of age, and those aged 45 years and older (Figure 1).

current smoking were less likely than former and never smokers to recall screening for diabetes in the past three years. In the multivariate analyses factors positively associated with screening for diabetes in the past three years included age greater than 45 years, family history of diabetes, a history of high cholesterol, but current smoking was inversely associated with screening (Table 2).

Figure 1. Percent of American Indian adults without diabetes reporting blood glucose screening in the past three years, 1999, 2001, 2003.



Each category increased significantly (P ≤0.05) from 1999 to 2003.

In the bivariate analyses, respondents aged 45 years and older, those reporting a higher number of visits to a health care professional in the past year, those with a family history of diabetes, and those with a history of high blood pressure and high cholesterol were more likely to recall screening for diabetes in the past three years (Table 1). Respondents who reported

Although the numbers of women reporting gestational diabetes who did not have a current history of diabetes were too small (N = 53 from 1999 to 2003) to assess trends, 79% of these high-risk women recalled being screened in the past three years.

Table 1. Characteristics of American Indian adults reporting blood glucose screening in the past three years, 2003.

	Screened for diabetes in the past three years % (n/N)
Age (years)	
18-44	72 (309/428)
45+	84 (319/379)*
Sex	
Male	75 (246/330)
Female	80 (385/481)
Visits to Physician (past year)	
Less than three	73 (277/380)
Three or more	83 (349/423)*
Family History of Diabetes	
Yes	82 (370/450)*
No	72 (261/361)
High Blood Pressure	
Yes	84 (192/229)*
No	75 (439/582)
High Cholesterol	
Yes	90 (136/152)*
No/Unknown	75 (495/659)
Obese⁺	
Yes	78 (392/504)
No	78 (213/275)
Smoking Status	
Current	73 (225/307)*
Former	82 (158/193)
Never	80 (245/308)

**P ≤0.05.*

⁺Bodymass index ≤30.0 kg/m²

SUMMARY

The majority of adult American Indians in Montana reported recent screening for diabetes, and the proportion screened has increased significantly over time. Tribal diabetes grants from the Indian Health Service have encouraged community screening across reservations. However, selected subgroups of individuals at high-risk for type 2 diabetes including those with hypertension and obesity and those who are younger than 45 years of age could benefit from screening.

It is encouraging to find blood glucose screening widely performed in Indian communities in Montana. Although screening for diabetes has been controversial in the past, finding undetected cases of diabetes is important[5]. In addition, blood glucose screening in any community now affords the opportunity to identify individuals with metabolic syndrome and pre-diabetes who are at risk for developing diabetes and cardiovascular disease and then to implement lifestyle changes and other treatments to prevent progression.

Table 2. Factors independently associated with blood glucose screening in the past three years among American Indian adults, 2003.

	Beta (Standard Error)	Odds Ratio (95% CI)
Factors*		
Sex (male)	-0.277 (0.188)	0.76 (0.52-1.10)
Age 45+ years	0.519 (0.195)	1.68 (1.15-2.46)
Family history of diabetes	0.669 (0.184)	1.95 (1.43-2.80)
Three or more visits to a physician in the past year	0.367 (0.188)	1.44 (1.00-2.09)
Current smoker	-0.531 (0.208)	0.59 (0.39-.088)
Former smoker	-0.085 (0.252)	0.92 (0.56-1.51)
High blood pressure	0.227 (0.233)	1.25 (0.79-1.98)
High cholesterol	0.839 (0.311)	2.31 (1.26-4.43)
Obese	0.236 (0.193)	1.27 (0.87-1.85)

**Referent groups include women, aged 18 to 44 years, never smoked cigarettes, never been diagnosed with high blood pressure, never been diagnosed with high cholesterol/unknown, and body mass index ≤30.0 kg/m².*

REFERENCES

1. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachlin JM, Walker EA, Nathan DM: Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*;346:393-403, 2002.

2. Meigs JB, Nathan DM, D'Agostino RB, Sr, Wilson PWF: Fasting and post-challenge glycemia and cardiovascular disease risk: the Framingham Offspring Study. *Diabetes Care*;25:1845-1850, 2002.

3. Isomaa B, Almgren P, Tuomi T, Forsen B, Lahti K, Nissen M, Taskinen MR, Groop L: Cardiovascular morbidity and mortality associated with the metabolic syndrome. *Diabetes Care*;24(4):683-689, 2001.

4. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. http://www.cdc.gov/brfss/index.htm (accessed November 16, 2004).

5. American Diabetes Association. Standards of Medical Care in Diabetes. *Diabetes Care*;28 (Supp1);S4-S36, 2005.

ACKNOWLEDGEMENTS

The authors acknowledge the tribal, Indian Health Service, and Urban Diabetes Coordinators and their staff members for their work to improve outreach and care for Indian communities in Montana.

REPORTED BY

- TS Harwell
- CS Oser
- EA Johnson
- SD Helgerson
- D Gohdes
- MT DPHHS
- C Strasheim
- TD Dennis
- Billings Area Indian Health Service
- KR Moore
- National Diabetes Prevention Program
- Indian Health Service

2005 DIABETES PROFESSIONAL CONFERENCE – MISSOULA, MONTANA – OCTOBER 6 - 7, 2005 SAVE THE DATE!

The Montana Diabetes Project's Annual Professional Conference will be held on Thursday and Friday, October 6 – 7, 2005 in Missoula, Montana at the Doubletree Hotel. This year's conference will include sessions addressing Research Updates on Diabetes, Diabetic Retinopathy, and Exercise in the Management and Prevention of Diabetes. Dr. Guenther Boden will be the keynote speaker. Dr. Boden is affiliated with the Temple University Health Science Endocrine/ Metabolic/Diabetes Section in Philadelphia, Pennsylvania. Educational credits will again be offered. For more information call Susan Day at 406-444-6677 or e-mail sday@mt.gov.

WHAT ARE THE MONTANA DIABETES PREVENTION AND CARDIOVASCULAR HEALTH PROGRAMS AND HOW CAN WE BE CONTACTED?

The Montana Diabetes Control and Cardiovascular Health Programs are funded through cooperative agreements with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32/CCU822743-02), the Division of Adult and Community Health (U50/CCU821287-02) and through the Montana Department of Public Health and Human Services.

The mission of the Diabetes Control and Cardiovascular Health Programs is to reduce the burden of diabetes and cardiovascular disease among Montanans. Our web pages can be accessed at http://ahec.msu.montana.edu/diabetes/default.htm and http://montanacardiovascular.state.mt.us.

For further information please contact us at:

Diabetes Program Manager:
Elizabeth "Liz" Johnson, RN, CNP
Phone 406/444-0593
e-mail lizj@mt.gov

CVH Program Manager:
Crystelle Fogle, MS, MBA, RD
Phone 406/947-2344
e-mail cfogle@mt.gov

Diabetes Quality Improvement Coordinator:
Nikki Buck, BAN, RN
Phone 406/444-7324
e-mail nbuck@mt.gov

Epidemiologist:
Carrie Oser, MPH
406/444-4002
e-mail coser@mt.gov

Diabetes Education Coordinator:
Marcene Butcher, RD, CDE
Phone 406/578-2075
e-mail marcibutcher@msn.com

Accountant:
Susan Day
Phone 406/444-6677
e-mail sday@mt.gov

CVH Admin. Assistant:
Ann Bay
Phone 406/444-5508
e-mail ebay@mt.gov

MONTANA CLINICAL COMMUNICATION & SURVEILLANCE REPORT

MONTANA
CARDIOVASCULAR HEALTH AND DIABETES PROGRAMS
720

Montana Department of Public Health and Human Services
Chronic Disease Prevention and Health Promotion Program
Room C314, Cogswell Building
PO Box 202951
Helena, Montana 59620-2951